

Claims

1. A method for determining clinical and/or chemical parameters (S1) in a medium (10), characterized in that

- there are means (2) for transmitting coherent light waves (6) and means (4) for receiving light waves (8),
- at least a part of the transmitted light waves (6) is delivered into the medium (10), and
- the means (4) for receiving light waves (8) measure at least a part of the light waves (8) reflected in the medium (10),

the parameters (S1) being determined on the basis of the properties of the transmitted and received light waves (6; 8).

2. Method according to Claim 1, characterized in that frequency or wavelength of the coherent light waves (6) is tuned in accordance with characteristics of the parameters (S1) to be determined.

3. Method according to one of Claims 1 or 2, characterized in that the means (4) for receiving light waves (8) are tuned in frequency-selective or wavelength-selective fashion.

4. Method according to one of Claims 1 to 3, characterized in that the means (2) for transmitting

coherent light waves (6) are operated so as to generate wavelengths between 400 and 1400 nm.

5. Method according to one of Claims 1 to 4, characterized in that cholesterol is determined as parameter (S1) and/or that its concentration in the blood is determined.

6. A method for determining clinical and/or chemical parameters (S2) in a medium (10), in particular according to one of Claims 1 to 5, characterized in that

- there are means (3) for transmitting microwaves (7a) and means (3) for receiving microwaves (7b),
- at least a part of the transmitted microwaves (7a) is delivered into the medium (10), and
- the means (3) for receiving microwaves (7b) measure at least a part of the microwaves (7b) reflected in the medium (10),

the parameters (S2) being determined on the basis of the transmitted and received microwaves.

7. Method according to Claim 6, characterized in that frequency or wavelength of the microwaves (7a) to be transmitted is tuned in accordance with characteristics of the parameters (S2) to be determined.

8. Method according to Claim 6 or 7, characterized in that the means (3) for transmitting and

receiving microwaves (7a, 7b) generate pulses of a duration between 83 and 133.3 ps.

9. Method according to one of Claims 5 to 8, characterized in that glucose is determined as parameter (S2) and that its concentration in the blood is determined.

10. Method according to one of Claims 1 to 9, characterized in that a position of the measurement path (100) in the medium (10) is established with the aid of the means (2) for transmitting coherent light waves (6) and the means (4) for receiving light waves (8) and that the determination of the parameters (S1, S2) is limited to the measurement path ~~(199)~~⁴.

11. Method according to Claim 10, characterized in that the means (2) for transmitting coherent light waves (6) are operated so as to generate light waves in the infrared region.

12. Method according to Claim 10 or 11, characterized in that a time point of a measurement performed in the measurement path (100) is established on the basis of a specifiable time signal, in particular of the heart cycle.

13. An apparatus for carrying out the method of one of Claims 1 to 12, characterized by provision of a laser unit (2), a phototransistor unit (4), and a monitoring unit (1), the

⁴ Should be "(100)"? Translator.

monitoring unit (1) being in operative connection with each of the laser unit (2) and the phototransistor unit (4).

14. Apparatus according to Claim 13, characterized in that there is a microwave unit (3) that is in operative connection with the monitoring unit (1).

15. Apparatus according to Claim 14, characterized in that the microwave unit (3) or its sending apparatus is supported movably in at least one plane, preferably in two planes.

16. Apparatus according to one of Claims 13 to 15, characterized in that the phototransistor unit (4) exhibits a frequency-sensitive or wavelength-sensitive tuning mode.

17. Apparatus according to Claim 16, characterized in that the frequency or the wavelength of the waves (8) to be detected is tunable.

19. Apparatus according to one of Claims 13 to 17, characterized in that a time point of a measurement performed in the measurement path (100) can be established on the basis of a specifiable time signal, in particular of the heart cycle.

[On the pages of drawings with Figure 2b and Figure 7:]

Replacement page (Rule 26)